

REMARKS

This paper is responsive to a non-final Office action dated November 28, 2003. Claims 1-47 were examined. Claim 38 has been amended to correct a grammatical error. Claim 34 was duplicative of claim 32 and has been canceled. Claim 35 has been amended to depend from claim 32 instead of claim 34. None of the claims have been amended to overcome any prior art of record, or for any other reason substantially related to patentability. The Examiner has indicated that claims 1 – 37 and 43 – 45 are allowable. Applicant appreciates the indication of allowable subject matter. Rejections of the remaining claims are traversed.

Rejections under 35 U.S.C. §102(e)

The Examiner has rejected claims 38 – 42 and 46 – 47 under 35 U.S.C. §102(e) as being anticipated by International Patent Application Publication No. WO 00/00885, naming Mario Wolczko as an inventor (“*Wolczko*”). Applicant respectfully traverses these rejections.

As a preliminary matter, Applicant respectfully notes that a published International Application cannot itself constitute §102(e) prior art (*see* 35 U.S.C. §102(e)). Proper rejection would be based on §102(a) of the statute. Accordingly, the response that follows presumes a rejection under §102(a).

The Office Action relies on the same sections of *Wolczko*, which disclose updating allocation site histograms and object tenuring, to reject independent claims 38 and 42. *Wolczko* discloses maintaining a histogram for each allocation site (*Wolczko* defines an allocation site as a piece of code that creates an object in the memory heap). The sections of *Wolczko* cited by the Office Action disclose updating the histograms to reflect the survival of objects after each scavenging.

Neither these cited sections, nor any other section of *Wolczko* disclose or suggest 1) associating allocation-time information and weak reference instances with a sampled subset of objects, and 2) uses of weak reference instances, as recited in claim 38. Applicant has provided an explanation of weak references in the specification, but Applicant has included the following excerpt to provide some helpful insight.

[A] weak reference is a reference to an object with the property that is not considered by an automatic dynamic memory management facility (e.g., a garbage collector) when determining the reachability of the referred-to object. As long as some other stronger reference keeps the object alive, the weak reference will continue to refer to the object. However, at some point, the collector determines that the object is only reachable from weak references of a given strength. Then, an “imminent death” action can be performed, followed by clearance of the weak reference so that the referred object can subsequently be reclaimed. As used herein, the term “weak reference” may be understood to include any suitable application, language, or execution environment facility in accordance with the above description.

Wolczko’s comparison of age field against histogram values and incrementing and decrementing the histogram values in accordance with the comparison, does not disclose or suggest **associating allocation-time information and an instance of a weak reference with a sampled subset of objects**. Referring more specifically to claim 38, *Wolczko* does not disclose or suggest “at least one functional sequence for associating a allocation-time information and an instance of a weak reference with at least a sampled subset of objects allocated by a storage allocator...and at least one functional sequence for sampling the sampled subset using the weak reference instances...”

As with claim 38, *Wolczko* does not disclose or suggest any of claim 42. The Office Action seems to reject claim 42 based on bundling together generation selection, an age field, and object tenuring. As already stated, *Wolczko* discloses updating allocation site histograms and tenuring objects. Disclosing updating of allocation site histograms and tenuring objects, does not disclose or suggest associating allocation-time information with sampled instances of software objects. The Office Action refers to a histogram updating section and refers to “selection of generations.” Applicant notes that the section of *Wolczko* cited in the Office Action (page 9, line 2) is not related to generation selection. Nonetheless, Applicant respectfully submits that neither the cited section nor the alleged disclosure of generation selection discloses or suggests associating allocation-time information with sampled instances of software objects as recited in claim 42.

Next, the Office Action simply refers to *Wolczko*’s age field and refers to the histogram updating section of *Wolczko*. As previously stated, the cited section merely discloses comparing an age field against a histogram value and updating the histogram accordingly. *Wolczko* does not

disclose or suggest referencing sampled instances of software objects. In addition, *Wolczko* does not disclose or suggest referencing reachable and unreachable sampled instances of the software objects. Referring more specifically to claim 42, *Wolczko* does not disclose or suggest “means for referencing the sampled instances of software objects, the referencing means operable for both reachable and unreachable ones thereof.”

The Office Action’s third statement in rejecting claim 42 seems to suggest that tenuring an object is similar to updating lifetime predictions for categories of software objects based on run-time access to states of sampled instances of the software objects and their associated allocation-time information. *Wolczko*’s disclosure of object tenuring does not disclose or suggest “means for updating lifetime predictions for categories of the software objects based on run-time access to states of corresponding ones of the sampled instances and associated allocation time information therefore.” ***Wolczko* especially does not update lifetime predictions based on run-time access because *Wolczko* utilizes information from prior executions.**

For at least the above reasons, independent claims 38 and 42 are allowable and dependents therefrom are also allowable. However, the Office Action also rejects dependent claims 46 and 47 based on an incorrect interpretation of the term tenuring. Tenuring is the promoting of an object in generationally organized memory (i.e., from a younger generation to an older generation), and is not freeing or deallocating objects as stated in the Office Action at page 4. *Wolczko* does not disclose or suggest “**sampling is performed coincident with death of respective ones of the sampled objects**” as in claim 46 and similarly in claim 47.

Wolczko does not anticipate any of Applicant’s claims. For at least the reasons above, independent claims 38 and 42 are allowable, and dependents therefrom are also allowable at least for the reasons above.

Conclusion

In summary, claims 1 – 33 and 35 – 47 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that, on the date shown below, this correspondence is being

- ☐ deposited with the US Postal Service with sufficient postage as first class mail, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
- ☐ facsimile transmitted to the US Patent and Trademark Office.

Date

Respectfully submitted,



Steven R. Gilliam, Reg. No. 51,734
Attorney for Applicant(s)
(512) 338-6320
(512) 338-6301 (fax)

EXPRESS MAIL LABEL: EV 436 536 692 US